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indicating that it had flowed under water. The geological sequence of events here seems to have been somewhat as follows:

A submerged land, when the sites of the great lakes were arms of the sea, such as we now find in Tierra del Fuego; volcanic activity, when lava flowed under water, as shown by the existing cellular basalt; elevation of the land, for we find numerous instances of upraised beaches with cellular basalt overlying them; following this, another period of volcanic action, and then an age of ice, for there is very marked evidence of ice-action on the basalt. In the present glaciers we have the lineal descendants of a glacial period.

The writer says that Patagonia is a fine field for the traveller who wishes to explore unknown glaciers and study glacial action. The climate, in summer, though cool, is very healthful.

GEOGRAPHICAL RECORD.

AMERICAN GEOGRAPHICAL SOCIETY.

TRANSACTIONS OF THE SOCIETY, APRIL, 1905.—A Regular Meeting of the Society was held at Mendelssohn Hall, No. 119 West Fortieth Street, on Tuesday, April 18, 1905, at 8.30 o'clock P.M.

Vice-President Moore in the chair.

The following persons, recommended by the Council, were elected Fellows:

Benjamin J. Macdonald.	Samuel N. Hoyt.
Percival Lowell.	Luis Enrique Bonilla.
Frederick W. Frankland.	W. A. Peck.
Charles E. Morrison.	William W. Pennell.
William D. Mount.	Arthur Blair Moody.
Amos Lawrence Mason.	Charles Franklin Rand.
Henry C. Swords.	C. W. Parks.
Charles H. Reckfus, Jr.	

The Chairman then introduced Professor E. L. Stevenson, who addressed the Society on The World as seen through the Eyes of Mediæval Map-makers. Stereopticon views were shown.

On motion, the Society adjourned.

AMERICA.

THE GEOGRAPHICAL SOCIETY OF PHILADELPHIA.—The growth of membership of this Society during the past two years has been very gratifying. After May 1 an initiation fee of \$5 will be charged in addition to the annual fee of \$5. The Society and its library are now commodiously housed at 1520 Chestnut Street, and the library is constantly growing. Professor Heilprin gave a course of six lectures on current geographic topics in April. The Society has two regular meetings each month from November to May inclusive, besides special courses of lectures; its autumn and spring excursions are attractive features.

EVAPORATION IN THE UNITED STATES.—The problem of accurate and comparable observations of evaporation has always been one of the most unsatisfactory subdivisions of meteorology. Evaporation depends upon so many different factors, and the difficulty of agreement upon some standard evaporimeter is so great that, so far, absolute values of the amount of water evaporated have not been obtainable.

Even when a free-water service under sunshine is taken as the basis of measurement, the results remain unsatisfactory, for the reason that the amount of evaporation depends upon the depth, extent, and temperature of the body of water, as well as upon many other local conditions. In the *Monthly Weather Review* for December, 1904, there appears a paper on *Evaporation Observations in the United States*, by H. H. Kimball, of the U. S. Weather Bureau, which was read before the National Irrigation Congress at El Paso, in November last. The usual method of determining evaporation by deducting the run-off from the rainfall over a watershed, and attributing the difference to evaporation, is unsatisfactory, for, as a practical problem in irrigation, evaporation from water surfaces is of more importance than that from land surfaces. In *Water Supply and Irrigation Papers*, No. 80, of the U. S. Geological Survey, Mr. George W. Rafter computed the evaporation for twelve drainage basins in the Eastern United States by this method; but the engineer must consider the question of losses in the case of storage basins of considerable area, and if these are situated in a dry region, the loss may amount to 30 to 50 per cent. of the amount of water stored.

Between the years 1876 and 1886, Mr. Desmond Fitzgerald carried out a very exhaustive series of evaporation experiments in connection with the reservoirs of the Boston, Mass., waterworks, and the results were set forth in the *Transactions of the American Society of Civil Engineers*, Vol. 15, September, 1886, pp. 581-646. These investigations related not only to actual measurements of evaporation by means of tanks floating on the surfaces of the reservoirs, but also to the relation between the rate of evaporation and the temperature of the water surface, the air temperature, the humidity, and the wind movement. The rate of evaporation was found to depend upon (1) the vapour pressure corresponding to the temperature of the water surface; (2) the vapour pressure corresponding to the dew-point of the atmosphere, and (3) the wind velocity. Professor L. G. Carpenter, at Fort Collins, Colorado, has, since 1887, carried on a series of evaporation measurements in the case of water in a tank three feet cube, the top being flush with the surface of the ground (Ann. Repts. Agric. Exp. Sta., Fort Collins, Colo.). The formula obtained agrees remarkably closely with that of Fitzgerald. There is a difference in the value of the co-efficient of the wind velocity (W.), which is attributed by Professor Carpenter to the fact that the velocity at Boston was measured at the water surface, and at Fort Collins it was obtained from an anemometer on the roof of a building.

In 1887-1888, Professor Russell, of the U. S. Signal Service (*Monthly Weather Review*, 1888, p. 235), investigated the rate of evaporation in standard thermometer shelters by means of Piche evaporimeters, in which evaporation takes place from the moist surface of a porous paper. A formula was obtained, and the monthly evaporation at 140 Signal Service stations was computed from July, 1887, to June, 1888, inclusive, on the basis of the monthly mean wet-bulb and dew-point temperatures derived from the tri-daily observations. A chart was then drawn, showing lines of equal annual depth of evaporation in inches from a free-water surface. Professor Russell's formula does not include the wind velocity term of the Fitzgerald and Carpenter formulas, the equation representing the evaporation with a wind velocity outside the shelter of 7.1 miles per hour, which was the mean velocity at the stations where the Piche observations were made in June, 1887.

The author of the paper in the *Monthly Weather Review* for December, 1904, above referred to, holds that this wind velocity does not apply to all parts of the United States for all seasons, and that for this, and other reasons, Professor Russell's formula does not rest upon as sound a physical basis as do the formulas of Fitzgerald and Carpenter. For the purpose of checking Professor Russell's computed

values, the following comparison is made by Mr. Kimball, the measurements of evaporation given in the second series having been made at stations near those given in Professor Russell's series. While the results are not strictly comparable, since the stations are not in all cases identical, and in some cases the reservoirs are at a greater altitude than the Weather Bureau stations, they are noteworthy. The results computed by formula are generally higher. Mr. Kimball points out that Russell's equation, deduced from tri-daily observations, is not applicable to the present 8 A. M. and 8 P. M. observations unless a correction is applied, and believes that the formulas of Fitzgerald and Carpenter have a general application if the temperature of the water surface, the dew-point, and the wind velocity are known.

ANNUAL EVAPORATION.

RUSSELL'S FORMULA.		SURFACE MEASUREMENTS.		
STATIONS.	EVAPORATION.	STATIONS.	EVAPORATION.	EXPOSURE.
	(inches.)		(inches.)	
Boston, Mass.....	34.4	Boston, Mass.....	34.78	Beacon Hill Reservoir.
New York, N. Y.....	40.6	" ".....	39.11	Chestnut Hill Reservoir, floating pan.
Cheyenne, Wyo.....	76.5	New York, N. Y.....	39.64	Croton Reservoir, floating pan.
		Laramie, Wyo.....	46.30	Ground.
		Fort Collins, Col.....	46.16	"
		" ".....	59.50	Computed for Reservoir.
El Paso, Tex.....	82.0	Fort Bliss, Tex.....	82.65	Floating pan.
Salt Lake City, Utah..	74.4	Fort Douglas, Utah.....	42.46	" "
Fort Grant, Ariz.....	101.2	Tucson, Ariz.....	75.78	" "
Prescott, Ariz.....	56.0	Tempe, Ariz.....	65.00	" "
Sacramento, Cal.....	54.3	Clear Lake, Cal.....	32.38	" "
		" ".....	33.40	Ground.
Fresno, Cal.....	65.8	Kingsbury Bridge, Cal...	47.79	Floating pan.
		" ".....	59.49	Ground.
Los Angeles, Cal.....	37.2	Arrowhead Reservoir....	36.60	" (Elev. 5,160 ft.)
San Diego, Cal.....	37.5	Sweetwater ".....	57.55	Floating pan.

R. DEC. W.

THE FREE ZONE OF MEXICO.—Many who do not know why a "Free Zone" was established in Mexico may be interested in the following explanation condensed from *Commercial Mexico in 1905*, issued by our Bureau of Statistics: The Free Zone is a strip 20 kilometers (12½ miles) wide, extending along the northern border of Mexico from the Gulf to the Pacific. It is not quite free, because goods entering it from the United States have to pay 11½ per cent. of the Mexican tariff. If the goods are transported across the Free Zone to other parts of Mexico they have to pay the full tariff charge.

When the Rio Grande became the boundary between the United States and Mexico, in 1848, the conditions on the two banks of the river differed widely from one another. In the United States there were no taxes on internal commerce, and the tariff charges were low. In Mexico the tariff was very high, and each State imposed duties on goods entering from other States. The result was that goods in the border Mexican towns cost two to four times as much as in the Texas towns across the river.

This caused immigration into the United States to such an extent that the neighbouring part of Mexico was likely to be turned into a desert. The final result was that the Mexican Government established the Free Zone along the entire border, so that the Mexicans living there might be placed on about the same footing, as to the prices of commodities, as their neighbours over the line. Conditions have since altered so much that the Free Zone is no longer regarded as a necessity, and some day it may be abolished.

AGRICULTURE IN THE WEST INDIES.—Sir Daniel Morris, in his presidential address before the Fifth Congress of West Indian Agriculturists, held at Port-of-Spain, Trinidad, in January, gave interesting information concerning the changes now in progress in the economic conditions of the islands. On the whole, sugar is still the backbone of the industries, though in some islands it is now of little importance. Trinidad has turned from sugar to cacao, and is now exporting this product to the value of about \$5,000,000 a year. The cacao crop is growing elsewhere, and the annual exports from Grenada are valued at about \$1,000,000, and from Jamaica at \$400,000. The cultivation of cotton is increasing, and Liverpool is paying good prices for the fibre. The export of fruit in many of the islands is now greater than the sales of sugar, and the trade in tobacco, rubber, Sisal hemp, and fish is growing. On the whole, the islands are recovering from the misfortunes due to the great fall in the price of sugar.

METEOROLOGY OF THE GREAT LAKES, 1904. THE METEOROLOGICAL CHART OF THE GREAT LAKES, No. 2, 1904, presents a summary of the meteorological conditions of the lake region during the season of navigation of 1904. The severity of the winter, and the unusually heavy accumulation of ice, prevented inter-lake navigation from becoming general until after the stormy period of spring had passed. The winter snowfall was heavy, and the greater part of the snow, especially in the northern districts, was preserved and was fed slowly into the lakes during the late spring and summer months; the stage of water on all the lakes, during the navigation season, being higher than any experienced for a number of years, except in the case of Lake Superior. The number of vessels totally lost through stress of weather was twenty. The loss due to fog was \$218,000; and the total loss due to weather conditions was \$467,425 less than during the previous season. Thirty-two lives were lost through stormy weather, this being a reduction of seventeen below the figures for 1903.

R. DEC. W.

RAINFALL ON THE COAST OF CHILE IN 1903.—A comparison between the rainfall during the year 1903 at Iquique and at Puerto Ancud, on the coast of Chile, brings out very clearly the difference between the desert region in the north, beyond the reach of the prevailing westerly winds, and the southern latitudes, where rain falls throughout the year. The contrast is similar to that found on the western coast of the North American continent, between Lower California and southern Alaska, or the coast of Washington. At Iquique (lat. 20° 12' S.) 0.59 inch of rain fell, on one day, in July (midwinter). At Puerto Ancud (lat. 41° 41' S.) the rainfall by months, and the distribution by days, was as follows:—

MONTH.	AMOUNT (inches).	DAYS.
Jan.....	3.23	14
Feb.....	3.66	12
Mar.....	6.89	18
Apr.....	10.08	17
May.....	8.42	21
June.....	13.39	25
July.....	8.70	19
Aug.....	10.63	23
Sept.....	10.75	24
Oct.....	3.66	13
Nov.....	3.50	14
Dec.....	6.93	13
Year.....	89.84	213

R. DEC. W.

THE ARGENTINE ANTARCTIC METEOROLOGICAL STATION AT SCOTIA BAY, SOUTH ORKNEYS.—Reference has lately been made in these *Notes* to the meteorological station at Scotia Bay, South Orkneys, which was originally established by the Scottish Antarctic Expedition, and has now been taken over by the Argentine Government. The *Scottish Geographical Magazine* for April, 1905, contains an account of the first year's work at this important station under Argentine auspices. During 1904 the lowest temperature occurred on August 3 and 4, with a minimum of -40° F., and a mean on the latter day of -33° F. In 1903 the minimum was -26° . A phenomenally high temperature of 46.8° was recorded on May 31, 1903, during a *foehn* wind, and a similar occurrence on August 28, 1904, gave a temperature of 40.0° . A heavy thunderstorm occurred in August, and another in October, this being an unusual occurrence. In 1903 the most severe gales came from N. W. to S. W., but in 1904 at least three severe gales came from S. E. The weather in 1904 was very different from that in 1903, being more severe, but fine for longer periods at a time. The contrast was probably due to the difference in the position of the pack-ice.

R. DEC. W.

AFRICA.

SALT IN AFRICA.—Between Senegal and the Central African lakes and between the Sahara and the Zambezi is an extensive region, too distant from the sea to supply itself with salt by evaporating sea-water; and as it has no salt deposits, the inhabitants rely, to an important extent, upon two plants—one a variety of the *arum* family, and the other a species of bamboo, which they dry and burn and then leach the ashes, using the residuum as we use salt, which it somewhat resembles in taste. The coast people of West Africa buy annually about 40,000 tons of salt that is shipped from Liverpool and is obtained chiefly from the salt district of Norwich, England. A few thousand tons of German salt are also sent to West Africa.

This European salt, however, is not available for trade more than about 130 miles inland, because the heat and humidity reduce it to a liquid state. It deteriorates in the storehouses on the coast, and even more during transportation. It is not European salt, therefore, that supplies the vast inland region from the Sahara to the Zambezi. Practically the sole source is the salt of the Sahara, which fills a part of the demand.

The product is put up in the form of bars of an average weight of 25 to 30 kilograms, each piece being about a metre in length, 30 centimeters wide, and from 5 to 8 centimeters thick. It is crude and dirty, and other substances mingled with it colour the salt red, black, or gray. But it has the great advantage over the imported articles that it is solid and withstands humidity. It is carried south from 1,000 to 1,200 miles without detriment.

The cost rapidly increases with the length of the journey. At Timbuktu it is sold at 1 franc a kilogram; at 2 francs on the Upper Niger; at 4 francs on the Congo; and more is paid south of that river. The commodity is inadequate in quantity, and every middleman has his profit. There are three regions of the Sahara which produce salt.

If European salt can be put up in such a way as to withstand the climate, there will be great profit in its exportation to inner Africa. The British have tried the experiment, but thus far have not succeeded in producing salt bars that are proof against tropical humidity. On the other hand, a French company, "La Société marseillaise du Sel aggloméré," is producing bar salt, in which, according to the *Revue des Deux Mondes*, the salt is compressed to half its original contents, is smooth

and glistening, and extremely hard. It is asserted that this salt bar withstands the climatic conditions. It is now being sent into the French colonies.

It is estimated that foreign salt which will retain its quality may be sold annually to the amount of 1,000,000 tons in inner Africa. The natives would welcome it as a great boon. (Condensed from Dr. C. Müller's "Die Salzversorgung Zentralafrikas," in the *Deutsche Rund. für Geog. und Stat.*, Vol. 27, No. 5.)

THE MARQUIS DE SEGONZAC IN CAPTIVITY.—In November last the Comité du Maroc of Paris sent the Marquis de Segonzac back to Morocco with Mr. Gentil, lecturer on geology at the Sorbonne, and Mr. R. de Flotte-Roquevaire (whose large map of Morocco is well known), as assistants, to engage in exploration in the southwestern part of Morocco. In April the news came that de Segonzac had been denounced by one of his guides as a Christian, and betrayed into the hands of the Seketana Berbers. The party arrived late last year at Mogador, the Atlantic seaport nearest to their field of work.

The tribes of the interior were in revolt against the Sultan, which greatly increased the danger of travel. It was decided to be unwise to work together, and so they divided the field. Gentil was assigned to study the geology of the City of Morocco and its environs and the Sus region; de Flotte-Roquevaire was to triangulate a district in the Great Atlas between Mogador and the City of Morocco, and de Segonzac was to explore a part of the southern slope of the Great Atlas and locate the hydrographic centres from which issue a number of the streams of that region.

Gentil and de Flotte-Roquevaire completed their work and returned to Mogador to await their leader. He wrote on Feb. 4 that he had explored the central part of the Great Atlas, had secured the material needed to map it, and had connected his new work with that which he had done in 1901. He intended to start for the coast in a few days. It is supposed that he is being held by his captors for a ransom.

This young and ardent explorer between 1899 and 1901 made a number of venturesome journeys, always in disguise; but in spite of the obstacles in his way he brought to France a harvest of scientific results in the form of route surveys, astronomical observations, ethnological notes and botanical and geological collections, which attracted much attention.

SENSIBLE TEMPERATURES ON THE CONGO.—In the BULLETIN for March, 1904 (Vol. XXXVI, pp. 129-138), reference was made to the various suggestions regarding the best method of expressing the temperatures which the human body feels under varying conditions of air temperature, moisture, wind velocity, exposure to direct insolation, and so on. It was there pointed out that the so-called "sensible temperature" is the complex resultant of many variables, and is so complex and so individual that no simple expression can be found for it. Nevertheless, various scales of sensible temperatures have been suggested, as, for example, those of Abbe, Osborne, Lancaster, and others; and we should doubtless gain much in our understanding of the physiological effects of various climates if we had, in addition to the ordinary records of meteorological elements, some tabulation of the feelings of comfort or discomfort experienced by the human body.

It is interesting to note, in this connection, that in a recent publication of the *Société Belge d'Astronomie* (*Bulletin*, No. 11, 1904, *La Chaleur au Congo*), prepared by J. Vincent, meteorologist at the Royal Observatory of Belgium, there is a tabulation and discussion of observed "sensible temperatures," recorded on the following

scale, originally proposed in the *Annuaire* of the Royal Observatory of Brussels for 1890:

Très chaud.....	Sueur abondante, malaise.
Chaud.....	Sueur; on est peu ou point incommodé par la chaleur.
Tiède.....	Sensation de chaleur sans sueur.
Tempéré.....	Etat indifférent. On s'assied en plein air sans pardessus.
Frais.....	Sensation de froid non désagréable aux mains. On ne a'assied plus en plein air sans pardessus.
Froid.....	Sensation de froid désagréable aux mains.
Tres froid.....	Sensation de froid insupportable aux mains; désagréable au visage.

These observations were made at Kisantu, at the mission of the Jesuit Fathers, and began December 14, 1903. They form part of the third series of meteorological observations taken in the Congo region at the instance of and by means of instruments given by the *Société Belge d'Astronomie*. The second series, taken at Tchimbane by Mons. A. Balat, contained the first systematic record from the Congo country of "sensible temperatures" (published in the *Bulletin* of the Société, Vols. 7 and 8). Among 169 noon observations made at Kisantu there were the following numbers according to the above scale: 8 *frais*; 48 *tempéré*; 82 *tiède*; 29 *chaud*; 2 *très chaud*. These observations were made in the shade, as they should have been. M. Vincent points out, in his comments on these records, that the evidence which they bring regarding the climatological, or sensible, temperature, is not unfavourable to the Congo district, and criticizes some statements previously made by Lancaster regarding the discomfort experienced there by reason of the high temperature and relative humidity (*Le Climat du Congo*, Brussels, p. 19). In regard to these criticisms, it may here be noted that, as was above suggested, individuals vary so much, for obvious reasons, regarding their feeling of heat or cold, and comfort or discomfort, that a careful comparison of "sensible temperature" observations, even when these have been carefully made according to a fairly well-defined scale, is hardly worth while. Doubtless many of the accounts of Congo climatic discomforts may have been somewhat exaggerated. Doubtless, also, no one but Brother Molitor himself, the observer at Kisantu, would have had just the sensations of heat and cold above tabulated,

R. DEC. W.

ANCIENT RUINS IN RHODESIA.—Mr. Richard N. Hall, who has given eight years to the study of the ancient monuments in southern Rhodesia, says (*Geog. Jour.*, April, 1905) that none of the hundreds of ruins has been more than partially explored. Many important ruins have been seen only by casual travellers, and the work of unearthing only a part of the Great Zimbabwe area would be more than the labour of a lifetime. Still, researches have made great progress in the past few years. There are in Rhodesia no less than 300 distinct ruins and groups of ruins. Only a few scores of these are entitled to rank as "ancient." The larger part of them probably does not date back of the thirteenth, fourteenth and fifteenth centuries.

There is overwhelming evidence at the Great Zimbabwe of the ancient civilization and arts possessed by the builders of the earliest period. The Zimbabwe temple is the finest and most intact example of a Nature-worshipping shrine known to the world. Its construction points unmistakably to some knowledge of geometry and astronomy on the part of the builders. It is quite certain that even the cruder methods at Zimbabwe of applying this knowledge, which was common to the

ancient Semitic peoples, were imported from the near East and did not originate in Southeast Africa. The right ascension of the sun, the heliacal rising and the meridian passages of stars, are believed to have been noted at Zimbabwe. These ancient builders were also past masters in the science of military defence, the walls showing that the builders were military strategists of the highest order. Their gold ornaments, finely designed and engraved, could not have been the work of an uncivilized people; and the hundreds of ancient gold mines show that they were skilled in metallurgy and picked out rich shoots, patches, and pockets with marvellous cleverness. It is estimated that from these widespread mines they extracted \$375,000,000 of gold.

ASIA.

ALBUM OF PHILIPPINE TYPES.—The volume with this title, published last year at Manila by the Philippine Government, contains 160 photographs of 80 men who were in Bilibid prison in 1903. This large penitentiary contains about 3,000 men. The persons whose photographs were taken were selected as fairly typical of the populations from which they came. Most of them are from the tribes officially denominated as Christian—the Tagalog, Visayan, Bicol, Cagayan, etc.; but the non-Christian tribes, including the Moro and the Negrito, are represented. Complete anthropological measurements are given for each of the subjects, and the introduction contains further particulars concerning the men photographed and estimates as to the value of each subject as typical of his tribe.

OCEANIA.

EXPLORATION IN NEW GUINEA.—Mr. A. E. Pratt, who recently returned to England from a two-years' expedition in the remote interior of British New Guinea, chiefly along the Owen Stanley Range, has sailed on a new scientific expedition, which is expected to last for two and a half years. Mr. Pratt, accompanied by his two sons, proceeded direct to Batavia, where he will make final arrangements for his journey. After conferring with the Dutch Government officials he will cross to Dobo, the chief town of the Aru Islands, a group very little known to Europeans. After making collections there, the expedition will cross to Dutch New Guinea, and will immediately strike into the interior, with the object of reaching the highest possible point of the Charles Louis range, a snow region running east and west and never yet explored. Valuable geographical results are expected, and a map will be made, but the special work of the expedition will be the collecting of natural-history specimens.

POLAR.

THE FRENCH ANTARCTIC EXPEDITION.—Further details of the work of Dr. Charcot's expedition have been received. Dr. Charcot reported by telegraph (*La Géog.*, Feb., 1905) that the *Français* wintered at Wandel Island, at the southern extremity of Gerlache (formerly Belgica) Strait, in 65° S. Lat. The *Uruguay*, in its search for the party, went within twenty miles of these winter quarters. The party succeeded in settling the question of Bismarck Strait by sending an expedition through it, proving its connection with the more eastern Sea. The strait was discovered by the German Dallman, in 1874, at the western end, and it has since been a question whether it was really a strait, cutting off the northern part of the Graham Land Peninsula, or only a fiord penetrating some way into the land.

The party also laid down the shore-line of a part of the unexplored west coast of Graham Land for a considerable distance to the south, and landings were made at

several points. It also explored the Palmer Archipelago, the islands separated by Gerlache Strait from the mainland. Impenetrable ice-pack prevented the explorers from reaching Alexander I. Land, though they came within sight of it. The *Français* ran aground on the Graham Land coast, but the serious leak resulting was fortunately repaired. Considerable additions to our knowledge of this region appear to have been made by Dr. Charcot's thirteen months' sojourn in the Antarctic.

ANOTHER ARCTIC ENTERPRISE.—It is reported that the Duc d'Orléans has organized a north polar expedition with which he will leave Norway early in May, accompanied by Capt. Gerlache, who commanded the Belgian Antarctic expedition. The party will proceed to Franz Josef Land, where an attempt may be made to push northward by means of a new channel. The object is not to reach the North Pole, but to make a further study of the archipelago. The Duke does not anticipate wintering in the Arctic, though his ship will be provisioned for that possible event. Besides the Norwegian crew the party will include a number of French scientific men. As the season appears to be early this year, it is thought that there will not be much difficulty in reaching Franz Josef Land.

COMMERCIAL GEOGRAPHY.

THE RAILROAD FROM ORENBURG TO TASHKENT.—In September last the Russians completed the railroad from Orenburg, a city on the eastern frontier of European Russia to Tashkent, the most important centre of commerce in Russian Central Asia. The line is 1,100 miles long. It is now the shortest and most direct route between Russia and Central Asia, and it will considerably diminish the importance of the Trans-Caspian railroad, as it will no longer be necessary to make the great detour to Caucasia and across the Caspian Sea in order to reach the heart of Central Asia. The road will also promote the development of civilization along the great valley of the Syr Daria. Large works for the accumulation and storage of water supplies are now in progress. Along some stretches of the road, water is in inadequate supply, and the deficiency is being remedied at great expense.

THE CAPE TO CAIRO RAILROAD.—According to the latest information, good progress is being made with the extension northward from the Victoria Falls of the Cape to Cairo railroad. It is expected that the railhead will be at Kalomo, the administrative centre of northwest Rhodesia (Barotseland) by June. The further extension of the line for 250 miles beyond Kalomo will be made by the Mashonaland Railroad Company, which is operating the line from Bulawayo northward. The terminus of the new extension at Broken Hill will be reached early next year. There will then be continuous railroad communication from Cape Town, a total distance of some 2,000 miles, to within 100 miles of the southeast corner of the Congo Free State. On the Victoria Falls—Kalomo section—50 miles of earthworks are finished and over 25 miles of rail laid.

THE MOST ELEVATED POINT ON THE RAILROAD AROUND THE CONGO CATA-RACTS.—The Congo Free State has changed the name of Sona Gongo, a station on the line from Matadi to Stanley Pool, to Thysville, in honour of Colonel Thys, under whose charge this railroad was built. The station is half way between Matadi and Stanley Pool, among the Crystal Mountains, at an elevation of 741 meters. It is one of the highest points in the Congo basin, 717 meters above Matadi, the starting-point, and 457 meters higher than Leopoldville, the terminus of the road. Trains on this road do not move in the dark, and all of them stop for the night at Thysville, making

the entire journey in the daylight of two days. The railroad company is now building a hospital for whites and another for blacks at this station, which seems to be a favourable location for the future sanatorium of the Congo State.—(*Le Mouve. Géog.*, No. 8, 1905).

TOBACCO IN SOUTHERN RHODESIA.—The Agricultural Department of Southern Rhodesia, where no white man dared to set his foot a quarter of a century ago, has become convinced that the country offers superior facilities for the cultivation of tobacco. In order to acquire helpful information, Mr. George M. Odium, a member of the staff, was sent to this country last year to study the industry in all its phases. The result of his work, published by the British South Africa Company, now appears in a handsome volume of 200 pages, under the title "The Culture of Tobacco." It is devoted to our tobacco soils, our methods of planting and cultivation, and the curing and marketing of the crop. A finer manual of the kind would be hard to find. Scores of half-tone pictures adorn the book, including photographs of tobacco fields in Southern Rhodesia, showing the crop in all stages of growth, and proving, at least, that it thrives vigorously there. It is asserted that this region is an ideal tobacco country. This is the latest illustration of the energy and push that are transforming Southern Rhodesia. White farmers are tilling the soil, and reapers and steam-diggers are busy where a few years ago native women were the only agriculturists.

EXPANSION OF CROP AREAS.—No result of the study of ecology is more valuable than the discovery and use of new fields adapted to the growth of plants of economic value. A few illustrations of this branch of geographic research from recent Consular Reports will show the importance of the study:

BANANAS—COLOMBIA.—The cultivation of this tropical fruit is being extended along the Gulf of Uraba, and also near Santa Marta, where the conditions of soil, sunshine, and rainfall have been found to be specially adapted. Already the earlier plantings have come to fruition, and the quality of the product augurs well for the industry. Local markets are excellent, and American markets, also, should furnish a good outlet for export.

Experiments in banana culture, first for coffee shade and now for export fruit, have given promising results in Mexico. The plant desires moderate upland not too near the sea, much sunshine and rain, and a clay soil. These conditions have been found in a belt of varying width near the coast in the States of Vera Cruz and Tabasco. Where transportation permits plantations are being set with slips. A possible manufacture of various products from the banana in the more inaccessible regions also promises the extension of its cultivation.

RAMIE—SOUTHERN STATES.—It has been insisted that our Southern States are especially adapted to the growth of this fibre plant. In the face of the growing European demand for the raw material, further study and experiments might give us another southern crop. A further suggestion of this kind which is being contemplated is the introduction of rubber culture into the Philippines to supply our market. This is urged because the soil, climate, and labour conditions are as well adapted to its production in these islands as in Borneo, Java, Ceylon, Sumatra, and the Malay Peninsula, where there is much activity in rubber culture.

COFFEE—QUEENSLAND.—Recently many studies to extend coffee culture have been made. Suitable conditions, barring some one element, have been found in many places, but few successful experiments have been made. A native coffee in several

parts of tropical Africa promises well, but real introduction, based on knowledge of geographic conditions, is, perhaps, best illustrated in Queensland, Australia. A fair local market has developed in the continent. The moderate upland soils and the climate, in the northern part, especially favour this crop.

HENEQUEN—QUEENSLAND.—This fibre, so valuable for binding-twine, cord, rope, etc., has been sought to occupy a warm, semi-arid, stony, hilly region, now producing little of value. Its introduction from Yucatan, where it is rapidly enriching the people, is the result of a careful study of conditions in both countries, and the success of the venture seems assured. The market in the grain districts of Victoria is large, and the foreign market is not glutted. Owing to its keeping qualities, it can be grown in the interior, whence transportation to the ports is long and hard, and yet come to market in good order.

COTTON ABROAD.—In 1900, 75-80 per cent of the world's cotton crop of about 7,000,000,000 pounds came from the United States, but cotton is grown in many tropical and sub-tropical countries. The increasing demand for it, and the increasing desire of nations to grow their own raw products, have stimulated investigation in cotton culture to a great extent. It seems that in many parts of Africa the industry finds specially suitable conditions. Labour is usually to be had; soil, rainfall, drainage, and long seasons are provided. Transportation is the great drawback. In the German East African cotton-growing districts not only are railroads being built to move the crop, but an automobile service to bring the product from plantation to railroad is being installed.

Cotton-growing is being introduced into Colombia at two or three points, and is being rapidly extended, where conditions permit, in the departments of Magdalena and Bolivar. It is estimated that there are in Colombia about 3,000,000 acres adapted to Colombian long-stapled cotton, comparable with that of Sea Island cotton.

In China much of the best cotton-producing land is more profitable for growing food than cotton, and most of the cotton produced is of an inferior quality. China as a market seems assured, because her use of cotton goods is growing rapidly.

G. D. H.

GENERAL.

DR. KLOTZ'S ASTRONOMICAL STATIONS.—Dr. Otto Klotz, Government Astronomer of Canada, has arranged with the Harvard Observatory for a station to perfect his series of longitude observations, for which the completion of the British trans-Pacific cable offered a fine opportunity. Beginning at Ottawa, he and his party made longitude connections with Fanning Island, the Fiji Islands, Norfolk Island, Queensland and Sydney, N. S. W., where his series of connections met a like series eastward to Sydney. This was the first circuit of the world made in work of this character.

At each of the stations a pier of cement or brick is erected, the longitude of which is determined by time differences, shown by telegraph with the utmost possible accuracy. Such a pier is to be erected at Harvard, so that Dr. Klotz may connect the Canadian trans-continental longitude series with the American series; ultimately a similar connection will be established between Vancouver and Seattle.

METEOROLOGY AT THE UNIVERSITY OF WISCONSIN.—The University of Wisconsin will, next year, give instruction in meteorology under Mr. James L. Bartlett, observer at the University station of the U. S. Weather Bureau.

GEOGRAPHY IN OXFORD DURING 1904.—The attendance at the School of Geography in Oxford was, in the Hilary term, 117; Easter term, 141; Michaelmas term, 146. The attendance of women was from 7 to 23. The total attendance was nearly double that of 1902. Lectures were delivered by Dr. Mackinder on the historical geography of Europe and of the British Isles; by Dr. Dickson, on the climatic regions of the globe; by Dr. Herbertson, on systematic and regional geography; by Dr. Grundy, on the strategic geography of Greece; and by Mr. Beazley, on the history of geography. The attendance was at times too large for the lecture-rooms. The reference library is constantly growing, and the collection of maps of Central Europe on a scale of at least 1:200,000, and of the British Isles, on a scale of 1:126,720, will soon be completed as far as they exist. The Committee welcomes contributions to the collections of the School.

ROYAL GEOGRAPHICAL SOCIETY MEDALS FOR 1905.—The Founder's Medal has been awarded to Sir Martin Conway for his various mountain explorations and work among the glaciers and mountains of Spitsbergen; the Patron's Medal to Captain C. H. D. Ryder for important results while acting as chief survey officer on the recent Tibetan mission; the Victoria Research Medal to Mr. J. G. Bartholomew for great contributions to the progress of cartography; the Murchison Grant to Mr. William Wallace for geographical work in the Protectorate of Northern Nigeria; the Gill Memorial to Col. F. R. Maunsell for explorations in Asia Minor; the Cuthbert Peek Grant to Mr. F. J. Lewis for contributions to knowledge of botanical distribution by researches in the north of England; and the Back Grant to Capt. Philip Maud for survey work on the south border of Abyssinia.

TRAVELS OF FRENCH STUDENTS.—In three years (1898-1900), Mr. Albert Kahn gave 75,000 francs to pay the expenses of five young men in each year, or fifteen in all, on journeys to different parts of the world. He desired to give to students who had completed their university course, and intended to be teachers in the higher schools, an opportunity to supplement their theoretical training with practical knowledge of various countries and peoples. The only condition he imposed was that the travelling students should be conversant with the English language. They were free to select their routes of travel and to dispose of the allotted year as they pleased.

The confidence he reposed in these young men seems to be fully justified by the book "*Autour du Monde par les Boursiers de Voyage de l'Université de Paris*," which has just been published. Thirteen of the fifteen students contribute to the book, two having been unavoidably prevented. They sum up the results of their observations in Palestine, Burma, Java, French Indo-China, Japan, the Philippines, America, India, New Zealand, and other of the French and British colonies. They have benefited by the generous and novel idea of Mr. Kahn, and the results of their studies in many parts of the world will not fail to be useful in their educational work.

MINERAL PRODUCTION OF CANADA IN 1904.—The Canadian Government Trade Enquiry Branch has issued a preliminary summary of the mineral production of the Dominion for 1904, from which it appears that the value of the metallic production was \$31,222,525, a falling off of about \$2,250,000 from 1903. This decrease appears to be due, not to an unfavourable condition of the metal industries, but to the subsidence of the inflation, occasioned by the rapid exploitation of the more easily accessible Yukon placers. The gold yield was worth \$16,400,000—a decline of about \$2,400,000 from 1903. The value of the other metallic products was: Copper,

\$5,510,119; iron ore exports, 401,738 tons; pig-iron from Canadian ore, \$901,880; lead, \$1,637,420; nickel, \$4,219,153; silver, \$2,127,859; zinc, \$24,356.

Among the non-metallic products were, coal, \$14,599,090; coke, \$1,884,219; asbestos, \$1,167,238; and petroleum, \$984,310. The total value of the mineral products was \$60,343,165.

DEATH OF PROFESSOR ADOLF BASTIAN.—Dr. Bastian, Director of the Berlin Museum für Völkerkunde, is dead in his eightieth year. In spite of his advanced age he was at the time of his death engaged on a scientific journey in Trinidad. Among the many scientific books of which he was the author “Die Völker des östlichen Asien” and “Die Kulturländer des alten Amerika” were especially conspicuous.

DER NATURWISSENSCHAFTLICHE VEREIN FÜR SCHLESWIG-HOLSTEIN, of Kiel, will celebrate its fiftieth anniversary by a festival on the 17th and 18th of June, 1905.

On the 17th, there will be an inspection of the Natural History collections of the University, and visits to the ships of war, and the dock yards, and a social reunion will be held in the evening at the Seebadeanstalt.

On the 18th of June, after a morning session in the University, and a luncheon, there will be an excursion on the Kiel Inlet.

Those who desire to attend the celebration are requested to send in their names by the 1st of June.

U. S. BOARD ON GEOGRAPHIC NAMES. DECISIONS, APRIL 5, AND MAY 3, 1905.
CHINESE PROVINCES:

ANHUI; (Not Nganhwei, Ngan-hwei, Ngan-hoei, Ngan-hui, Ngan-hwuy, nor Ngan-Hwuy.)

CHEH KIANG; (Not Cheh-kiang, Chekiang, nor Che-kiang.)

* CHIH LI; (Not Pechili, Pe-chili, Pe-chi-li, Chih-li nor Chi-li.)

* FUHKIEN; (Not Fukien, Fu-kien, Fuh-kien, nor Foo-kien.)

HONAN; (Not Ho-nan.)

HSIN CHIANG; (Not Eastern Turkestan, nor Kashgaria.)

HUNAN; (Not Hu-nan nor Hoo-nan.)

HUPEH; (Not Hu-peh nor Hoo-pe.)

KANSU; (Not Kan-su, Kansuh, nor Kan-soo.)

KIANGSI; (Not Kiang-si nor Kiang-se.)

KIANGSU; (Not Kiang-su.)

KUANGSI; (Not Kwangsi, Kwang-si, nor Quang-se.)

KUANGTUNG; (Not Kwangtung, Kwang-tung, Kwantung, Kang-tung, nor Quang-tung.)

KUEICHOU; (Not Kui-chou, Kweichou, Kwei-chow, nor Quei-chow.)

* Revision of previous decisions.

SHANGTUNG; (Not Shantung nor Shan-tung.)

SHANSI; (Not Shan-si nor Shan-se.)

SHENSI; (Not Shen-si nor Shen-se.)

SSUCH'UAN; (Not Szechuen, Sze-chuen, nor Sze-chuan.)

YÜNNAN; (Not Yunnan, Yun nan, nor Yun-nan.)

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MUKDEN; *city, China.* (Not Mookden nor Moukden.)

BANKA; island, lying between Sumatra and Borneo. (Not Banca nor Bangka.)

CAPTAINS; bay, Alaska. Between Iliuliuk bay and Nateekin bay.

* CARQUINEZ; bay, point, and strait, connecting Suisun and San Pablo bays, California. (Not Carquines, Karquines, nor Karquenas.)

* CHOUTEAU; county, Montana. (Not Choteau.)

* DONA ANA; county, P. O., R. R. station and precinct, New Mexico. (Not Donna Ana nor Doña Ana.)

GRASS; river, tributary to the St. Lawrence river, St. Lawrence County, New York. (Not De Grasse, Grasse, nor La Grasse.)

* Iliuliuk; harbour, Alaska. An arm of Unalaska bay, east of Dutch harbor. (Not Unalaska, Captains Harbor, not Levashef.)

LE CONTE; bay and glacier, east of Mitkof island, Frederick sound, southeastern Alaska. (Not Hutli, Hulti, nor Thunder.)

* LEWIS AND CLARK; county, Montana. (Not Lewis and Clarke.)

LITTLE SALMON; stream tributary to Lake Ontario near Texas, and about 4 miles west of Salmon river, Oswego County, New York. (Not Salmon.)

PORT LEVASHEF; port, Alaska, at head of Captains bay. (Not Captains harbor nor St. Paul.)

SYCAMORE; creek, tributary to Verde river from the N.E., Yavapai county, Arizona. (Not Dragoon nor Dragoon Fork.)

* Revision of previous decision.

CHEFOO; city, China. (Not Chifu, Chi-fu, Che-foo, Chee-foo, nor Tschi-fu.)

LIAOYANG; city, China. (Not Liau-yang, Liao-yang, nor Liaoyan.)

TIELING; city, China. (Not Thielsing, Tie-ling, nor Telin.)

AMERICAN CORNERS; village, P.O., and district, Caroline county, Maryland. (Not American Corner.)

CHOGA; creek, Macon county, North Carolina. (Not Chogee.)

HINCHINBROOK; principal entrance to Prince William Sound, Southern Alaska. (Not Meiklejohn.)

HUGHES; P. O. and R. R. station, Butler county, Ohio. (Not Hughs.)

INDIAN; creek, Chowan county, North Carolina. (Not Dillard nor Dillard Mill.)

MARSHYHOPE; branch of the Nanticoke river, Dorchester and Caroline counties, Maryland; and Kent and Sussex counties, Delaware. (Not Marshy Hope, Marsh Hope, West Branch of Nanticoke river, West or N. W. Fork of Nanticoke, nor N. W. Prong of Nanticoke.)

NORRIS; glacier on the west side of Taku Inlet, southeastern Alaska. (Not Kadischle, Kadishle, nor Windom.)

SALT LAKE CITY; city, capital of Utah. (Not Salt Lake.)

SANTEETLAH; creek and P. O., Graham county, North Carolina. (Not Santeetla nor Santutlah.)

SHEWBIRD; P. O. and mountain, Clay county, North Carolina. (Not Shoo Bird nor Shoobird.)

SHOSHONE; established for all place-names, but not for tribal name or Reservation.

TAKU; glacier at the head of Taku Inlet, southeastern Alaska. (Not Klumū Gutta, Klumma Gutta, nor Foster.)

There is substantial agreement among authorities with regard to the names of the Chinese provinces, and it does not seem to be wise to prefer the unusual forms *Anhui* and *Hsinchiang* to *Nganwei* and *Sinkiang*; and the Board, in writing *Chefoo* for *Chifu*, disregards its own excellent principle of adopting the Italian vowel-sounds.—(EDITOR BULLETIN.)